

7-7 Operations on Functions

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

$$f(-1) = 3(-1)^2 + 7(-1) = -4$$

$$g(-1) = 2(-1)^2 - (-1) - 1 = 2$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

SUM $(f + g)x = f(x) + g(x)$

$$(f + g)x = 3x^2 + 7x + 2x^2 - x - 1$$

$$5x^2 + 6x - 1$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

Difference $(f - g)x = f(x) - g(x)$

$$(f - g)x =$$

$$3x^2 + 7x - (2x^2 - x - 1)$$

$$x^2 + 8x + 1$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

Product $(f \cdot g)x = f(x) \cdot g(x)$

$$(f \cdot g)x = (3x^2 + 7x)(2x^2 - x - 1)$$

$$6x^4 - 3x^3 - 3x^2 + 14x^3 - 7x^2 - 7x$$

$$(f \cdot g)x = 6x^4 + 11x^3 - 10x^2 - 7x$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

Quotient $\left(\frac{f}{g}\right)x = f(x) \div g(x)$

$$\left(\frac{f}{g}\right)x = \frac{3x^2 + 7x}{2x^2 - x - 1} \quad \begin{matrix} 2x^2 - 2x + 1x - 1 \\ 2x(x-1) + 1(x-1) \end{matrix}$$

$$= \frac{3x^2 + 7x}{(2x+1)(x-1)} \quad x \neq 1, -\frac{1}{2}$$

~~$\frac{-2}{-2} + 1$~~

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$3(x^2 - 8x + 16) - 2x + 8$
 $3x^2 - 24x + 48 - 2x + 8$
 $3x^2 - 26x + 56$

$$[f \circ g](x) = f[g(x)]$$

$$= 3(x-4)^2 - 2(x-4) + 1$$

$$[g \circ f](x) = g[f(x)]$$

$$= 3x^2 - 2x + 1 - 4$$

$$= 3x^2 - 2x - 3$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](3) =$$

$$\begin{aligned} & 3 - 4 \\ & = -1 \\ & f(-1) = 6 \end{aligned}$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](7) =$$

$$\begin{aligned} & 7 - 4 \\ & f(3) \\ & = 22 \end{aligned}$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[g \circ f](3) =$$

$$3(3)^2 - 2(3) + 1 = 22$$

$$g(22)$$

$$= 18$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$g[f(2)] =$$

$$3(2)^2 - 2(2) + 1$$

$$g(9)$$

$$= 5$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](x) = f[g(x)]$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[g \circ f](x) = g[f(x)]$$

Sets

$$f = \{(2,6) (9,4) (7,7) (0,-1)\}$$

$$g = \{(7,0) (-1,7) (4,9) (8,2)\}$$

$$f \circ g = \{(7,-1) (-1,7) (4,4) (8,6)\}$$

Sets

$$f = \{(2,6) (9,4) (7,7) (0,-1)\}$$

$$g = \{(7,0) (-1,7) (4,9) (8,2)\}$$

$$g \circ f = \{(9,9) (7,0) (0,7)\}$$

DO:

$$f = \{(8,9) (6,4) (10,9) (12,6)\}$$

$$g = \{(6,8) (4,6) (8,9) (9,12)\}$$

$$f \circ g = \{(6,9) (4,4) (9,6)\}$$

$$g \circ f = \{(8,12) (6,4) (12,8)\}$$

Hw

p387-388

17, 20, 23-31 odd

35, 41, 45